# Identification and characterization of a rich population of CD34(+) mesenchymal stem/stromal cells in human parotid, sublingual and submandibular glands.

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**Public Summary:**

**Scientific Abstract:**
Mesenchymal stem/stromal cells (MSCs) play crucial roles in maintaining tissue homeostasis during physiological turnovers and injuries. Very little is known about the phenotype, distribution and molecular nature of MSCs in freshly isolated human salivary glands (SGs) as most reports have focused on the analysis of cultured MSCs. Our results demonstrate that the cell adhesion molecule CD34 was widely expressed by the MSCs of human major SGs, namely parotid (PAG), sublingual (SLG) and submandibular (SMG) glands. Further, gene expression analysis of CD34(+) cells derived from fetal SMGs showed significant upregulation of genes involved in cellular adhesion, proliferation, branching, extracellular matrix remodeling and organ development. Moreover, CD34(+) SMG cells exhibited elevated expression of genes encoding extracellular matrix, basement membrane proteins, and members of ERK, FGF and PDGF signaling pathways, which play key roles in glandular development, branching and homeostasis. In vitro CD34(+) cell derived SG-MSCs revealed multilineage differentiation potential. Intraglandular transplantation of cultured MSCs in immunodeficient mice led to their engraftment in the injected and uninjected contralateral and ipsilateral glands. Engrafted cells could be localized to the stroma surrounding acini and ducts. In summary, our data show that CD34(+) derived SG-MSCs could be a promising cell source for adoptive cell-based SG therapies, and bioengineering of artificial SGs.